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In an ion implantation apparatus, a reduction of an energy contamination is achieved when ions are implanted into a wafer with a low energy. A beam transportation efficiency between mutually different positions on a beam line correlates with the energy contamination of the wafer, and the beam transportation efficiency is adjusted so that the energy contamination becomes small. Since the beam transportation efficiency is obtained by measuring a beam electric current at each position, the beam transportation efficiency can be obtained before the ions are implanted into the wafer.